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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Daniel D. Bloch

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EXAMINER

PUNNOOSE, ROY M

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/966,987

Applicant(s)

BLOCH ET AL.

Examiner

Roy M. Punnoose

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 17-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8, 9, 24 and 25 is/are allowed.
- 6) ☒ Claim(s) 1-7, 10, 11, 17-23 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. Receipt of the amendment filed by the applicant on November 29, 2004 is acknowledged. The amendments made to the claims have been accepted and have been entered into the records. Applicant has cancelled claims 12-16. Claims 1-11 and 17-26 are currently pending in the application.

### *Response to Arguments*

2. Applicant's arguments filed on November 29, 2004 have been fully considered but they are not persuasive and therefore **this action is made final** for reasons given below. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

3. Applicant has amended claims 1 and 17 to include the recitation "and wherein said optical fiber is movable in a radial direction toward and away from hole wall."

4. In response to applicant's argument that "none of the cited references teach or suggest movement of an optical fiber in a radial direction toward and away from hole wall as now recited by amended independent claims 1 and 17", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

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With regard to applicant's argument (in "Remarks" of pages 9 and 10) that optical fiber is movable in a radial direction toward and away from hole wall, it should be noted that the optical fiber probe of Van Hengel et al is not a tight fit in the hole and therefore fiber is movable in a radial direction toward and away from hole wall. The same logic and argument is applicable to the Brown, Kawahara and Peterson references. The optical fiber/probe in those references is capable of moving in a radial direction toward and away from hole wall. In view of the teachings of Van Hengel, Brown, Kawahara and Peterson, applicant's argument is not convincing or persuasive.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 11, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927).

7. Claims 1, 2, 11, 17 and 18 are rejected because:

A. Van Hengel et al (Van Hengel hereinafter) discloses an apparatus comprising:

at least one optical probe 14 capable of being introduced into the hole 9, wherein said probe 14 directs light radially toward a hole-wall 10 and receives light reflected off the hole-wall 10 (see Figures 2 and 3);

a light source 11 for providing light to said optical probe 14;

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a display 23 (see Figure 3) for representing the measurements of the characteristics of the hole; and

an optical receiver 18 for receiving light from said optical probe 14 that has reflected off the hole wall 10 and been received by said optical probe 14, said optical receiver 18 also adapted to measure the intensity (see col.7, lines 13-15) of the light reflected off the hole wall 10 so as to permit different materials to be distinguished (see col.6, lines 14-49), wherein said optical probe 14 is capable of being introduced into the hole 9 without contacting the hole-wall 10 on a substrate comprising a stack of materials 2, 3, 4, 5 (see Figure 2) for measurement of the characteristics of the interior of the hole.

However, Van Hengel do not teach of an optical probe having at least one optical fiber to direct light radially toward a hole-wall and to receive light reflected off the hole-wall for non-contact measurement of the characteristics of the interior of the hole.

- B. Brown teaches of an optical probe 10 (see col.6, lines 13-16 and Figure 1) having at least one optical fiber 30 to direct light radially toward a hole-wall 14 and to receive light reflected off the hole-wall 14 for non-contact measurement of the characteristics of the interior of the hole.
- C. In view of Brown's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Brown's teaching of an optical probe comprising at least one optical fiber into Van Hengel's apparatus light can be easily and efficiently transmitted and/or received with said optical fiber for non-contact measurement of the characteristics of the interior of the hole.

8. Claims 3 and 19 are rejected because Van Hengel and Brown teach all the claim limitations as detailed in paragraph 9 above except for the explicit disclosure of identifying an interface between two materials. Van Hengel discloses a stack of four different materials (see Figure 2), wherein one of the middle layers can be considered as an interface. Therefore, in view of Van Hengel's disclosure measuring of a stack of materials, it would have been obvious to one of ordinary skills in the art at the time the invention was made to easily and efficiently identify an interface between two materials with non-contact measurement of the characteristics of the interior of the hole.

9. Claims 4 and 20 are rejected because Van Hengel and Brown teach all the claim limitations as detailed in paragraphs 9 and 10 above except for the explicit disclosure of distinguishing between a material that defines the hole and air so as to identify the backside of the hole. Since air can be considered as a material, it would have been obvious to one of ordinary skills in the art at the time the invention was made to identify and distinguish an interface between air and any given material so as to easily and efficiently identify the backside of the hole with non-contact measurement of the characteristics of the interior of the hole.

10. Claims 5 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927) and further in view of Kawahara (US 3,817,635).

11. Claims 5 and 21 are rejected because:

- A. Van Hengel and Brown discloses all the claim limitations as detailed in paragraph 9 above except for the teaching of the use of a collimating lens in optical communication with a distal end of said optical fiber for transmitting collimated

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light toward the hole-wall for non-contact measurement of the characteristics of the interior of the hole.

B. Kawahara discloses the use of a collimating lens 52 in optical communication with a distal end of said optical fiber 29 for transmitting collimated light toward the hole-wall (see col.5, line 65- col.6, line 7 and Figure 14) for non-contact measurement of the characteristics of the interior of the hole.

C. In view of Kawahara's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Kawahara's teaching of the use of a collimating lens into Van Hengel's and Brown's apparatus for the purpose easily and efficiently transmitting collimated light toward the hole-wall for a more accurate non-contact measurement of the characteristics of the interior of the hole.

12. Claims 6, 7, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927) and Kawahara (US 3,817,635) and further in view of Doyle, Jr. (US6,633,378).

13. Claims 6 and 22 are rejected because:

A. Van Hengel, Brown and Kawahara discloses all the claim limitations as detailed in paragraphs 9 and 13 above except for the teaching of the use of a focal lens in optical communication with a distal end of said optical fiber for transmitting focused light toward the hole wall and wherein said optical fiber is moveable in a radial direction in order to coincide the focal point of the light with the hole wall for non-contact measurement of the characteristics of the interior of the hole.

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- B. Doyle, Jr. (Doyle hereinafter) discloses the use of a focal lens 10 (see col.4, lines 39-42) in optical communication with a distal end of an optical fiber 8 for transmitting focused light toward a hole wall and wherein said optical fiber is moveable in a radial direction in order to coincide the focal point of the light with the hole wall for non-contact measurement of the characteristics of the interior of the hole.
- C. In view of Doyle's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Doyle's teaching of the use of a focal lens into Van Hengel, Brown and Kawahara's apparatus for the purpose of easily and efficiently transmitting focused light toward a hole wall and wherein said optical fiber is moveable in a radial direction in order to coincide the focal point of the light with the hole wall for a more accurate non-contact measurement of the characteristics of the interior of the hole.

14. Claims 7 and 23 are rejected because:

- A. Van Hengel, Brown and Kawahara discloses all the claim limitations as detailed in paragraphs 9 and 13 above except for the explicit teaching that the optical fiber is rotatable to permit the distance to the hole wall to be measured at various points about the circumference for non-contact measurement of the characteristics of the interior of the hole.
- B. Kawahara's apparatus comprising/including the optical fiber is rotatable to permit the distance to the hole-wall to be measured at various points about the



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circumference for non-contact measurement of the characteristics of the interior of the hole.

- C. Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to rotate Kawahara's apparatus comprising/including the optical fiber to permit the distance to the hole-wall to be measured at various points about the circumference for a more efficient and accurate non-contact measurement of the characteristics of the interior of the hole.

15. Claims 10 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Hengel et al (US 5,317,387) in view of Brown (US 5,895,927) and further in view of Peterson (US 5,325,177).

16. Claims 10 and 26 are rejected because:

- A. Van Hengel and Brown discloses all the claim limitations as detailed in paragraph 9 above except for the teaching of the use of a position feedback device for determining the linear position of said optical fiber relative to the hole-wall for non-contact measurement of the characteristics of the interior of the hole.
- B. Peterson discloses a position feedback device 64 (see col.4, lines 19-59) for determining the linear position of an optical fiber relative to the hole-wall for non-contact measurement of the characteristics of the interior of the hole.
- C. In view of Peterson's teaching, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Peterson's teaching of the use of a position feedback device into Van Hengel's and Brown's apparatus for the purpose easily and efficiently determining the linear position of

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said optical fiber relative to the hole-wall for a more accurate non-contact measurement of the characteristics of the interior of the hole.

***Allowable Subject Matter***

17. Claims 8, 9, 24 and 25 are allowable.

18. Claims 8, 9, 24 and 25 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious an apparatus and method for measuring characteristics of a hole comprising a movable mirror and an optical splitter for directing light from a light source both to said movable mirror and an optical fiber, in combination with the rest of the limitations of the respective claims.

***Drawings***

19. The drawings are objected to under 37 CFR 1.83(a) because they fail to show item 41 in Figure 8 as described on page 16, line 25 of the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be

labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

20. Applicant's arguments filed on November 29, 2004 have been fully considered but they are not persuasive and therefore **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Conclusion***

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Roy M. Punnoose** whose telephone number is **571-272-2427**.

The examiner can normally be reached on 9:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Gregory J. Toatley, Jr.** can be reached on **571-272-2800 ext.77**. The fax phone number for the organization where this application or proceeding is assigned is **703-872-9306**.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Roy M. Punnoose**  
Patent Examiner  
Art Unit 2877  
March 07, 2005



**Gregory J. Toatley, Jr.**  
Supervisory Patent Examiner

